

**English translation of the amendments under PCT Article 34 of the International Patent Application No. PCT/CH02/00706 "Zwischenwirbelimplantat mit kardanisch gelagerten Gelenkteilen" im Namen der Mathys Medizinaltechnik AG**

Patent Claims

1. Intervertebral implant (1), specifically an artificial intervertebral disk, with a central axis (2), an upper section (10), suitable for laying onto the base plate of a vertebral body lying above and a lower section (20) suitable for laying onto the cover plate of a vertebral body lying below, wherein

A) the upper section (10) is provided with a ventral side area (11), a dorsal side area (12), two lateral side areas (13,14), a top apposition surface (15) and a bottom surface (16);

B) the lower section (20) is provided with a ventral side area (21), a dorsal side area (22), two lateral side areas (23,24), a bottom apposition surface (25) and a top surface (26);

C) the two sections (10,20) moveable in relation to each other by means of two joints (38;39) arranged between the two sections (10;20), wherein

D) each of the joints (38;39) is provided with a swivel axle (3;4) and the two swivel axles (3;4) are arranged perpendicular to each other;

E) the two joints (38;39) are realised by means of an upper joint element (31) connected with the upper section (10), a central joint element (32) and a lower joint element (33) connected with the lower section (20), whereby

F) the central joint section (32) is connected with the lower joint section (33) by means of at least one axle (62) coaxial to the swivel axle (3) and rotating around the swivel axle (3) and with the upper joint section (31) by means of at least one axle (61) coaxial to the swivel axle (4) and rotating around the swivel axle (4).

characterised in that

G) a means (40) is provided that is suitable for causing temporary blocking of the mobility of the two sections (10,20) around the joint (30), whereby

H) that the means (40) comprises an insert (41) with a lower end (45) and an upper end (46) and a depression (42;43) in the surfaces (16;26) at each of the two sections (10;20), which are open on the ventral side areas (11;21), and

I) that the insert (41) with its ends (45;46) can be inserted into each of the depressions (42;43).

2. Intervertebral implant (1) according to Claim 1, characterised in that the central joint element (32) is provided in the form of a frame.
3. Intervertebral implant (1) according to Claim 1, characterised in that the central joint section (32) is designed in the form of a cross.
4. Intervertebral implant (1) according to Claim 1, characterised in that the central joint section (32) is designed in the form of an angle.
5. Intervertebral implant (1) according to one of the Claims 1 to 4, characterised in that a means (40) is provided that keeps the two sections (10;20), measured at their ventral side areas (11;21), at a fixed distance from each other.
6. Intervertebral implant (1) according to one of the Claims 1 to 5, characterised in that the means (40) can be attached to the two ventral side areas (11,21) of the two sections (10;20).
7. Intervertebral implant (1) according to one of the Claims 1 to 6, characterised in that the depressions (42;43) are dovetail guides and the ends (45;46) on the insert (41) are arranged complementary to these dovetail guides.
8. Intervertebral implant (1) according to Claim 7, characterised in that the dovetail guides are tapered from the ventral side areas (11;21) towards the dorsal side areas (12;22).
9. Intervertebral implant (1) according to one of the Claims 1 to 8, characterised in that the means (40) comprises two insert pieces (63) parallel to the lateral side surfaces (13;14;23;24), which can be attached to the surfaces (16;26) facing each other.
10. Intervertebral implant (1) according to one of the Claims 1 to 9, characterised in that the insert (41) can be attached to one of the two sections (10;20) by means of a screw (44) in a way that can be released.

11. Intervertebral implant (1) according to one of the claims 1 to 10, characterised in that the upper and the lower sections (10;20) each comprises at least two drill holes (80) running through from the ventral side areas (11;21) to the apposition surfaces (15;25) with longitudinal axes (83) for receiving bone fixation devices (81).

12. Intervertebral implant (1) according to Claim 11, characterised in that the longitudinal axes (83) of the drill holes (80) make an angle  $\gamma$  with the central axis (2).

13. Intervertebral implant (1) according to Claim 12, characterised in that the angle  $\gamma$  lies in a range of between 20° and 65°.

14. Intervertebral implant (1) according to one of the claims 11 to 13, characterised in that the longitudinal axes (83) of the drill holes (80) as seen from the ventral side areas (11;21) diverge from the inner surfaces (16;26) against the apposition surfaces (15;25).

15. Intervertebral implant (1) according to one of the claims 11 to 14, characterised in that the drill holes (80) are conically tapered towards the apposition surfaces (15;25).

16. Intervertebral implant (1) according to one of the claims 11 to 15, characterised in that the drill holes (80) are provided with an internal thread (82).

17. Process for the replacement of a defect, natural intervertebral disk by an intervertebral implant, characterised by the steps:

- A) blocking of the joint(s) (38;39) of an intervertebral implant (1) through the special means (40) in a certain position of the joint(s) (38;39);
- B) insertion of the intervertebral implant (1) into the intervertebral space to be treated;
- C) release and removal of the means (40) inserted into the intervertebral implant (1) for blocking the joint(s) (38;39).

18. Process according to Claim 17, characterised in that it additionally comprises the subsequent blocking of the joint(s) (38;39) on the implanted intervertebral implant (1) through the means (40).

### Summary

Intervertebral implant (1), specifically an artificial intervertebral disk, with a central axis (2), an upper section (10), suitable for laying onto the base plate of a vertebral body lying on top and a lower section (20), suitable for laying onto the cover plate of a vertebral body lying below, wherein

A) the upper section (10) is provided with a ventral side area (11), a dorsal side area (12), two lateral side areas (13,14), a top apposition surface (15) and a bottom surface (16);

B) the lower section (20) is provided with a ventral side area (21), a dorsal side area (22), two lateral side areas (23,24), a bottom apposition surface (25) and a top surface (26);

C) the two sections (10,20) are moveable in relation to each other by means of one joint (30) arranged between the two sections (10;20), wherein

D) the joint (30) is a universal joint with two swivel axles (3;4) standing perpendicular to each other.